SEQUENCE LISTING

<110> Huang, Lan-Qing
      Van Pel, Aline
      Brasseur, Francis
      De Plaen, Etienne
      Boon, Thierry

<120> Tumour Rejection Antigens

<130> L0461.70115US00

<140> US 09/856,812
<141> 2001-05-25

<150> GB 9826143.1
<151> 1998-11-27

<160> 57

<170> PatentIn Ver. 3.2

<210> 1
<211> 369
<212> PRT
<213> Homo sapiens

<400> 1
Met Pro Arg Ala Pro Lys Arg Gln Arg Cys Met Pro Glu Glu Asp Leu
 1   5   10   15

Gln Ser Gln Ser Glu Thr Gln Gly Leu Glu Gly Ala Gln Ala Pro Leu
            20   25   30

Ala Val Glu Glu Asp Ala Ser Ser Ser Thr Ser Thr Ser Ser Ser Phe
        35   40   45

Pro Ser Ser Phe Pro Ser Ser Ser Ser Ser Ser Ser Ser Ser Cys Tyr
    50   55   60

Pro Leu Ile Pro Ser Thr Pro Glu Glu Val Ser Ala Asp Asp Glu Thr
65   70   75   80

Pro Asn Pro Pro Gln Ser Ala Gln Ile Ala Cys Ser Ser Pro Ser Val
                85   90   95

Val Ala Ser Leu Pro Leu Asp Gln Ser Asp Glu Gly Ser Ser Ser Gln
            100   105   110

Lys Glu Glu Ser Pro Ser Thr Leu Gln Val Leu Pro Asp Ser Glu Ser
            115   120   125

Leu Pro Arg Ser Glu Ile Asp Glu Lys Val Thr Asp Leu Val Gln Phe
    130   135   140

```
Leu Leu Phe Lys Tyr Gln Met Lys Glu Pro Ile Thr Lys Ala Glu Ile
145                 150             155                 160

Leu Glu Ser Val Ile Lys Asn Tyr Glu Asp His Phe Pro Leu Leu Phe
                165             170             175

Ser Glu Ala Ser Glu Cys Met Leu Leu Val Phe Gly Ile Asp Val Lys
            180             185             190

Glu Val Asp Pro Thr Gly His Ser Phe Val Leu Val Thr Ser Leu Gly
        195             200             205

Leu Thr Tyr Asp Gly Met Leu Ser Asp Val Gln Ser Met Pro Lys Thr
    210             215             220

Gly Ile Leu Ile Leu Ile Leu Ser Ile Ile Phe Ile Glu Gly Tyr Cys
225             230             235             240

Thr Pro Glu Glu Val Ile Trp Glu Ala Leu Asn Met Met Gly Leu Tyr
            245             250             255

Asp Gly Met Glu His Leu Ile Tyr Gly Glu Pro Arg Lys Leu Leu Thr
            260             265             270

Gln Asp Trp Val Gln Glu Asn Tyr Leu Glu Tyr Arg Gln Val Pro Gly
        275             280             285

Ser Asp Pro Ala Arg Tyr Glu Phe Leu Trp Gly Pro Arg Ala His Ala
    290             295             300

Glu Ile Arg Lys Met Ser Leu Leu Lys Phe Leu Ala Lys Val Asn Gly
305             310             315             320

Ser Asp Pro Arg Ser Phe Pro Leu Trp Tyr Glu Glu Ala Leu Lys Asp
            325             330             335

Glu Glu Glu Arg Ala Gln Asp Arg Ile Ala Thr Thr Asp Asp Thr Thr
            340             345             350

Ala Met Ala Ser Ala Ser Ser Ser Ala Thr Gly Ser Phe Ser Tyr Pro
    355             360             365

Glu
```

```
<210> 2
<211> 234
<212> PRT
<213> Homo sapiens

<400> 2
Met Leu Leu Gly Gln Lys Ser Gln Arg Tyr Lys Ala Glu Glu Gly Leu
  1               5               10              15
```

```
Gln Ala Gln Gly Glu Ala Pro Gly Leu Met Asp Val Gln Ile Pro Thr
            20                  25                  30

Ala Glu Glu Gln Lys Ala Ala Ser Ser Ser Ser Thr Leu Ile Met Gly
        35                  40                  45

Thr Leu Glu Glu Val Thr Asp Ser Gly Ser Pro Ser Pro Pro Gln Ser
    50                  55                  60

Pro Glu Gly Ala Ser Ser Ser Leu Thr Val Thr Asp Ser Thr Leu Trp
65                  70                  75                  80

Ser Gln Ser Asp Glu Gly Ser Ser Ser Asn Glu Glu Glu Gly Pro Ser
                85                  90                  95

Thr Ser Pro Asp Pro Ala His Leu Glu Ser Leu Phe Arg Glu Ala Leu
            100                 105                 110

Asp Glu Lys Val Ala Glu Leu Val Arg Phe Leu Leu Arg Lys Tyr Gln
        115                 120                 125

Ile Lys Glu Pro Val Thr Lys Ala Glu Met Leu Glu Ser Val Ile Lys
    130                 135                 140

Asn Tyr Lys Asn His Phe Pro Asp Ile Phe Ser Lys Ala Ser Glu Cys
145                 150                 155                 160

Met Gln Val Ile Phe Gly Ile Asp Val Lys Glu Val Asp Pro Ala Gly
                165                 170                 175

His Ser Tyr Ile Leu Val Thr Cys Leu Gly Leu Ser Tyr Asp Gly Leu
            180                 185                 190

Leu Gly Asp Asp Gln Ser Thr Pro Lys Thr Gly Leu Leu Ile Ile Val
        195                 200                 205

Leu Gly Met Ile Leu Met Glu Gly Ser Arg Ala Pro Glu Glu Ala Ile
    210                 215                 220

Trp Glu Ala Leu Ser Val Met Gly Ala Val
225                 230
```

```
<210> 3
<211> 3510
<212> DNA
<213> Homo sapiens

<220>
<221> CDS
<222> (1955)..(3064)

<400> 3
cagggagatg gtggctttgg cgtgcaagac ccatacacga ttcagcagga gggaaaggct 60
gggctgtcgg gagtaaatct gaatacctgg aggacaccca aataaaggaa gtccccgtct 120
```

```
tgtccccctc ccctgcccac cacccccccc ccccccgcca aatgtctgct ccttctgtca 180
gctttgggaa tcccatgcag gtgtgatcgt gtggtgcccc tccccacttc tgcctgccgg 240
gtctcaggga ggtgaggacc ttggtctgag ggttgctaag aagttattac agggttccac 300
acttggtcaa cagagggagg agtcccagaa tctgcaggac ccaagggggtg cccccttagt 360
gaggactgga ggtacctgca gcccagaaag aagggatgtc acagagtctg gctgtcccct 420
gttcttagct ctgaggggac ctgatcagga ttggcactaa gtggcaagct caattttacc 480
acaggcagga agatgaggaa ccctcaggga aatggagttt tggtgtaaag gggagatatc 540
agccctggac accccacagg gatgacagga tgtggctcct tcttactttt gttttggaat 600
ctcagggagg tgagaacctt gctctcagag ggtgactcaa gtcaacacag gaacccctc 660
ttttctacag acacagtggg tcgcaggatc tgacaagagt ccaggtaagg aacctgaggg 720
aaatctgagg gtaccccccag cccataacac agatgggggtc cccacagaaa tctgccatga 780
ccctactgtc actctggaga acccagtcag ggctgtccgc tgagtctccc tgtcttatac 840
aaggatcact ggtctctggg agggagaggt gttggtctaa gggagctgca ctcgggtcag 900
cagagggagg gtcccagacc ctgccaggag tcaaggtgag gactgagggg acaccattct 960
ccaaacgcac aggactcagc cccaccctac cccttctgtc agccacggga attcatgggg 1020
aactgggggt agatggactc ccctcacttc ctctttccat gtctcctgga ggtaggacct 1080
tggtttaagg aagtggcctc agatcaacaa agggagggtc ccaggtcgta tcaggcatca 1140
agaagaggac caagcaggct cctcacccca gtacacatgg acccagctga atatggccac 1200
ctcttgctgt ctttttctggg aggacctctg cagttgtggc cagatgtggg tcccctcatg 1260
tcttctattt cgtatcaggg atgtaagctt ttgatctgag agtttcttag accagcaaag 1320
gagcagggtc taggctttt caggagaaag gtgagagccc cacgtgagca cagaggctcc 1380
ccaccccagg gtagtgggga actcacagag tccagcccac cctcctgaca cactgggag 1440
gctgggggctg tgcttgcagc ctgaaccctg agggcccctc aattcctctt tcaggagctc 1500
cagggactgt gaggtgaggc cttggtctaa ggcagtgttt tcaggtcaca gagcagaaag 1560
ggcccagaca gtgccaggag tcaaggtgag gtgcatgccc tgaatgtgta ccaagggccc 1620
cacctgctcc aggacaaagt ggaccccact gcatcagctc cacctaccct actgtcagtc 1680
ctggagcctt ggcctctgcc ggctgcatcc tgaggagcca tctctcactt ccttcttcag 1740
gttctcaggg gacagggaga gcaagaggtc aagagctgtg ggacaccaca gagcagcact 1800
gaaggagaag acctgtaagt tggcctttgt tagaacctcc agggtgtggt tctcagctgt 1860
ggccacttac accctccctc tctccccagg cctgtgggtc cccatcgccc aagtcctgcc 1920
```

```
cacactccca cctgctaccc tgatcagagt catc atg cct cga gct cca aag cgt 1975
                                      Met Pro Arg Ala Pro Lys Arg
                                       1               5
```

```
cag cgc tgc atg cct gaa gaa gat ctt caa tcc caa agt gag aca cag 2023
Gln Arg Cys Met Pro Glu Glu Asp Leu Gln Ser Gln Ser Glu Thr Gln
         10              15                  20
```

```
ggc ctc gag ggt gca cag gct ccc ctg gct gtg gag gag gat gct tca 2071
Gly Leu Glu Gly Ala Gln Ala Pro Leu Ala Val Glu Glu Asp Ala Ser
     25              30                  35
```

```
tca tcc act tcc acc agc tcc tct ttt cca tcc tct ttt ccc tcc tcc 2119
Ser Ser Thr Ser Thr Ser Ser Ser Phe Pro Ser Ser Phe Pro Ser Ser
 40              45                  50                      55
```

```
tcc tct tcc tcc tcc tcc tcc tgc tat cct cta ata cca agc acc cca 2167
Ser Ser Ser Ser Ser Ser Ser Cys Tyr Pro Leu Ile Pro Ser Thr Pro
                 60              65                  70
```

```
gag gag gtt tct gct gat gat gag aca cca aat cct ccc cag agt gct 2215
Glu Glu Val Ser Ala Asp Asp Glu Thr Pro Asn Pro Pro Gln Ser Ala
             75              80                  85
```

```
cag ata gcc tgc tcc tcc ccc tcg gtc gtt gct tcc ctt cca tta gat    2263
Gln Ile Ala Cys Ser Ser Pro Ser Val Val Ala Ser Leu Pro Leu Asp
            90              95                  100

caa tct gat gag ggc tcc agc agc caa aag gag gag agt cca agc acc    2311
Gln Ser Asp Glu Gly Ser Ser Ser Gln Lys Glu Glu Ser Pro Ser Thr
    105             110                 115

cta cag gtc ctg cca gac agt gag tct tta ccc aga agt gag ata gat    2359
Leu Gln Val Leu Pro Asp Ser Glu Ser Leu Pro Arg Ser Glu Ile Asp
120             125                 130                 135

gaa aag gtg act gat ttg gtg cag ttt ctg ctc ttc aag tat caa atg    2407
Glu Lys Val Thr Asp Leu Val Gln Phe Leu Leu Phe Lys Tyr Gln Met
                140                 145                 150

aag gag ccg atc aca aag gca gaa ata ctg gag agt gtc ata aaa aat    2455
Lys Glu Pro Ile Thr Lys Ala Glu Ile Leu Glu Ser Val Ile Lys Asn
                155                 160                 165

tat gaa gac cac ttc cct ttg ttg ttt agt gaa gcc tcc gag tgc atg    2503
Tyr Glu Asp His Phe Pro Leu Leu Phe Ser Glu Ala Ser Glu Cys Met
            170                 175                 180

ctg ctg gtc ttt ggc att gat gta aag gaa gtg gat ccc act ggc cac    2551
Leu Leu Val Phe Gly Ile Asp Val Lys Glu Val Asp Pro Thr Gly His
    185                 190                 195

tcc ttt gtc ctt gtc acc tcc ctg ggc ctc acc tat gat ggg atg ctg    2599
Ser Phe Val Leu Val Thr Ser Leu Gly Leu Thr Tyr Asp Gly Met Leu
200                 205                 210                 215

agt gat gtc cag agc atg ccc aag act ggc att ctc ata ctt atc cta    2647
Ser Asp Val Gln Ser Met Pro Lys Thr Gly Ile Leu Ile Leu Ile Leu
                220                 225                 230

agc ata atc ttc ata gag ggc tac tgc acc cct gag gag gtc atc tgg    2695
Ser Ile Ile Phe Ile Glu Gly Tyr Cys Thr Pro Glu Glu Val Ile Trp
                235                 240                 245

gaa gca ctg aat atg atg ggg ctg tat gat ggg atg gag cac ctc att    2743
Glu Ala Leu Asn Met Met Gly Leu Tyr Asp Gly Met Glu His Leu Ile
            250                 255                 260

tat ggg gag ccc agg aag ctg ctc acc caa gat tgg gtg cag gaa aac    2791
Tyr Gly Glu Pro Arg Lys Leu Leu Thr Gln Asp Trp Val Gln Glu Asn
    265                 270                 275

tac ctg gag tac cgg cag gtg cct ggc agt gat cct gca cgg tat gag    2839
Tyr Leu Glu Tyr Arg Gln Val Pro Gly Ser Asp Pro Ala Arg Tyr Glu
280                 285                 290                 295

ttt ctg tgg ggt cca agg gct cat gct gaa att agg aag atg agt ctc    2887   .
Phe Leu Trp Gly Pro Arg Ala His Ala Glu Ile Arg Lys Met Ser Leu
                300                 305        ·            310
```

```
ctg aaa ttt ttg gcc aag gta aat ggg agt gat cca aga tcc ttc cca   2935
Leu Lys Phe Leu Ala Lys Val Asn Gly Ser Asp Pro Arg Ser Phe Pro
            315             320             325

ctg tgg tat gag gag gct ttg aaa gat gag gaa gag aga gcc cag gac   2983
Leu Trp Tyr Glu Glu Ala Leu Lys Asp Glu Glu Glu Arg Ala Gln Asp
            330             335             340

aga att gcc acc aca gat gat act act gcc atg gcc agt gca agt tct   3031
Arg Ile Ala Thr Thr Asp Asp Thr Thr Ala Met Ala Ser Ala Ser Ser
   345             350             355

agc gct aca ggt agc ttc tcc tac cct gaa taa agtaagacag attcttcact 3084
Ser Ala Thr Gly Ser Phe Ser Tyr Pro Glu
360             365             370

gtgttttaaa aggcaagtca aataccacat gattttactc atatgtggaa tctaaaaaaa 3144
aaaaaaaaaa aagttggtat catggaagta gagagtagag cagtagttac attacaatta 3204
aataggagga ataagttcta gtgttctatt gcacagtagg atgactatag ttaacattaa 3264
gatattgtat attacaaaac agctagaagg aaggcttttc aatattgtca ccaaaaagaa 3324
atgataaatg catgaggtga tggatacact acctgatttg atcattatac tacatataca 3384
tgaatcagaa catcaaattg tacctcataa atatctacaa ttacatgtca gtttttgttt 3444
atgttttgt ttttttttaa tttatgaaaa caaatgagaa tggaaatcaa tgatgtatgt 3504
ggtgga                                                            3510
```

<210> 4
<211> 2559
<212> DNA
<213> Homo sapiens

```
<400> 4
tccggggtcg ctcgagccgg ccgggactcg gggatcasaa gtaacggcgg yymkygtkct 60
gagggacagg cttgagatcg gctgaagaga gcgggcccag gctctgtgag gaggcaaggg 120
aggtgagaac cttgctctca gagggtgact caagtcaaca cagggaaccc ctctttttcta 180
cagacacagt gggtcgcagg atctgacaag agtccaggtt ctcaggggac agggagagca 240
agaggtcaag agctgtggga caccacagag cagcactgaa ggagaagacc tgcctgtggg 300
tccccatcgc ccaagtcctg cccacactcc cacctgctac cctgatcaga gtcatcatgc 360
ctcgagctcc aaagcgtcag cgctgcatgc ctgaagaaga tcttcaatcc caaagtgaga 420
cacagggcct cgagggtgca caggctcccc tggctgtgga ggaggatgct tcatcatcca 480
cttccaccag ctcctctttt ccatcctctt ttccctcctc ctcctcttcc tcctcctcct 540
cctgctatcc tctaataccxa agcaccccag aggaggtttc tgctgatgat gagacaccaa 600
atcctcccca gagtgctcag atagcctgct cctccccctc ggtcgttgct tcccttccat 660
tagatcaatc tgatgagggc tccagcagcc aaaaggagga gagtccaagc accctacagg 720
tcctgccaga cagtgagtct ttacccagaa gtgagataga tgaaaaggtg actgatttgg 780
tgcagtttct gctcttcaag tatcaaatga aggagccgat cacaaaggca gaaatactgg 840
agagtgtcat aaaaaaattat gaagaccact tcccttttgtt gtttagtgaa gcctccgagt 900
gcatgctgct ggtctttggc attgatgtaa aggaagtgga tcccactggc cactcctttg 960
tccttgtcac ctccctgggc ctcacctatg atgggatgct gagtgatgtc cagagcatgc 1020
ccaagactgg cattctcata cttatcctaa gcataatctt catagagggc tactgcaccc 1080
ctgaggaggt catctgggaa gcactgaata tgatggggct gtatgatggg atggagcacc 1140
tcatttatgg ggagcccagg aagctgctca cccaagattg ggtgcaggaa aactacctgg 1200
agtaccggca ggtgcctggc agtgatcctg cacggtatga gtttctgtgg ggtccaaggg 1260
ctcatgctga aattaggaag atgagtctcc tgaaattttt ggccaaggta aatgggagtg 1320
```

```
atccaagatc cttcccactg tggtatgagg aggctttgaa agatgaggaa gagagagccc 1380
aggacagaat tgccaccaca gatgatacta ctgccatggc cagtgcaagt tctagcgcta 1440
caggtagctt ctcctaccct gaataaagta agacagattc ttcactgtgt tttaaaaggc 1500
aagtcaaata ccacatgatt ttactcatat gtggaatcta aaaaaaaaaa aaaaaaaagt 1560
tggtatcatg gaagtagaga gtagagcagt agttacatta caattaaata ggaggaataa 1620
gttctagtgt tctattgcac agtaggatga ctatagttaa cattaagata ttgtatatta 1680
caaaacagct agaaggaagg cttttcaata ttgtcaccaa aaagaaatga taaatgcatg 1740
aggtgatgga tacactacct gatgtgatca ttatactaca tatacatgaa tcagaacatc 1800
aaattgtacc tcataaatat ctacaattac atgtcagttt ttgtttatgt ttttgttttt 1860
ttttaattta tgaaaacaaa tgagaatgga aatcaatgat gtatgtggtg gagggccagg 1920
ctgaggctga ggaaaataca gtgcataaca tctttgtctt actgttttct ttggataacc 1980
tggggacttc ttttcttttc ttcttggtat tttattttct ttttcttctt cttctttttt 2040
ttttttaaca aagtctcact ctattgctct ggcaggagtg cagtggtgca gtctcggctc 2100
actgcaactt ccgcctcctg ggttcaagcg attctcctgc ctcagtctcc tgagtagctg 2160
ggattacaag tgtgcaccac catacccggc taattttgta ttttttagta gagatggggt 2220
ttcaccatgt tggccaggct ggtctcaaac tcctgacctc aggtaatctg cccgcctcag 2280
cctcccaaag tgctgggata acaggtgtga gcccactgca ccccagcctc ttcttggtat 2340
tttaaaatgt tgttactttt actagaatgt ttatgagctt cagaatctaa ggtcacacgt 2400
tcgtttctgt ttatccagtt taagaaacag ttttgctatt ttgtaaaaca aattgggaac 2460
ccttccatca tatttgtaat ctttaataaa ataacatgga attggaatag taattttctt 2520
ggaaatatga aaaaatagta aaatagagaa ataattttt                        2559
```

```
<210> 5
<211> 3839
<212> DNA
<213> Homo sapiens

<220>
<221> CDS
<222> (2196)..(2900)

<400> 5
agtctcagat cactggagag aggtgcccca gagcccttaa ggaggactca gcagacctcc 60
catcatggcc taggaaacct gctcccactc tcaggtctgg gcacccaagg caggacagtg 120
gggaagggat gtggcccccc cactttctgg tagggggggcc tcaaggagat ggtggccttg 180
gcatgcaaga cacatccacg gttcagcagg aaggaaaggg ccatgccttg tcgtggagta 240
aatatgaata cctggatgac acccagacag agaaagaccc catgaaacct actacttctg 300
tcagccgtgg gaatcccatg cagggttgtc catgtagtgc ctccttactt ctgcctcctg 360
ggtctcaggg aggtagcaac ctgggtctga agggcgtcct cagctcagca gagggagcca 420
cacctgttca acagagggac ggggtcacag gatctgcagg acccaagatg tgctcacttt 480
gtgatgaatg ggggtactcc tggcctggaa agaagggacc ccacaaagtc tggctaactt 540
tggttattat ctctggggga acccgatcaa gggtggccct aagtggagat ctcatctgta 600
ctgtgggcag gaagttgggg aaacgcagga agataaggtc ttggtggtaa ggggagatgt 660
ctgctcatat cagggtgttg tgggttgagg aagggcgggc tccatcaggg gaaagatgaa 720
taaccccctg aagaccttag aacccaccac tcaagaacaa gtagggacag atcctagtgt 780
cacccctgga cacccctaccc agtggtcatc agatgtggtg gctcctcatt tctctcttga 840
gtctcaggga agtgaggacc ttgttctcag agggcaactc aggacaaaac agggaccccc 900
atgtgggcaa cagactcagt ggtccaagaa tctaccaaga gtctaggtga caacactgag 960
ggaagattga gggtaccctc gatggttctc ctagcaggca aaaaacagat ggggggcccaa 1020
cagaaatctg cccggcctct tttgtcaccc ctgagagcat gagcaggact atcagctgag 1080
gcccctgtgt tataccagac tcattggtct cagggagaag aaggccttgg tctgagggca 1140
ctgcattcag gtcagcagag cggggggtcca aggccctgcc aggagtcagg gactcagagg 1200
acaccactca ccaaacacac aggaccgaac cccacccctgc accttctgtc agccatggga 1260
agtgcaggga aaggtggggtg gatggaatcc cctcatttgc tcttccagtg tctcctggag 1320
```

```
ataggtcctt ggattaagga agtggcctca ggtcagccca ggacacatgg gccccaatgt 1380
attttgtgta gctattgctt ttttctcacc ctaggacaga cacgtgggcc ccattgcatt 1440
ttgtgtagct attgcttttt tcccaggagg ccttgggcat gtggggccag atgtgggtcc 1500
cttcatatcc ttgtcttcca tatcagggat ataaactctt gatctgaaag tttctcaggc 1560
cagcaaaagg gccagatcca ggccctgcca ggagaaagat gagggccctg aatgagcaca 1620
gaaaggacca tccacacaaa atagtgggga gctcacagag tcaggctcac cctcctgaca 1680
gcactggggt gctggggctg tgcttgcagt ctgcagcctg agttcccctc gatttatctt 1740
ctaggagctc caggaaccag gctgtgaggt cttggtctga ggcagtatct tcaatcacag 1800
agcataagag gcccaggcag tagtagcagt caagctgagg tggtgtttcc cctgtatgta 1860
taccagaggc ccctctggca tcagaacagc aggaacccca cagttcctgg ccctaccagc 1920
ccttttgtca gtcctggagc cttggccttt gccaggaggc tgcaccctga gatgccctct 1980
caatttctcc ttcaggttcg cagagaacag gccagccagg aggtcaggag gccccagaga 2040
agcactgaag aagacctgta agtagacctt gttagggca tccaggqtgt agtacccagc 2100
tgaggcctct cacacgcttc ctctctcccc aggcctgtgg gtctcaattg cccagctccg 2160

gcccacactc tcctgctgcc ctgacctgag tcatc atg ctt ctt ggg cag aag        2213
                                        Met Leu Leu Gly Gln Lys
                                         1                   5


agt cag cgc tac aag gct gag gaa ggc ctt cag gcc caa gga gag gca       2261
Ser Gln Arg Tyr Lys Ala Glu Glu Gly Leu Gln Ala Gln Gly Glu Ala
             10                  15                  20


cca ggg ctt atg gat gtg cag att ccc aca gct gag gag cag aag gct       2309
Pro Gly Leu Met Asp Val Gln Ile Pro Thr Ala Glu Glu Gln Lys Ala
         25                  30                  35


gca tcc tcc tcc tct act ctg atc atg gga acc ctt gag gag gtg act       2357
Ala Ser Ser Ser Ser Thr Leu Ile Met Gly Thr Leu Glu Glu Val Thr
     40                  45                  50


gat tct ggg tca cca agt cct ccc cag agt cct gag ggt gcc tcc tct       2405
Asp Ser Gly Ser Pro Ser Pro Pro Gln Ser Pro Glu Gly Ala Ser Ser
 55                  60                  65                  70


tcc ctg act gtc acc gac agc act ctg tgg agc caa tcc gat gag ggt       2453
Ser Leu Thr Val Thr Asp Ser Thr Leu Trp Ser Gln Ser Asp Glu Gly
                 75                  80                  85


tcc agc agc aat gaa gag gag ggg cca agc acc tcc ccg gac cca gct       2501
Ser Ser Ser Asn Glu Glu Glu Gly Pro Ser Thr Ser Pro Asp Pro Ala
             90                  95                  100


cac ctg gag tcc ctg ttc cgg gaa gca ctt gat gag aaa gtg gct gag       2549
His Leu Glu Ser Leu Phe Arg Glu Ala Leu Asp Glu Lys Val Ala Glu
         105                  110                  115


tta gtt cgt ttc ctg ctc cgc aaa tat caa att aag gag ccg gtc aca       2597
Leu Val Arg Phe Leu Leu Arg Lys Tyr Gln Ile Lys Glu Pro Val Thr
     120                  125                  130


aag gca gaa atg ctt gag agt gtc atc aaa aat tac aag aac cac ttt       2645
Lys Ala Glu Met Leu Glu Ser Val Ile Lys Asn Tyr Lys Asn His Phe
135                  140                  145                  150
```

```
cct gat atc ttc agc aaa gcc tct gag tgc atg cag gtg atc ttt ggc     2693
Pro Asp Ile Phe Ser Lys Ala Ser Glu Cys Met Gln Val Ile Phe Gly
            155                 160                 165

att gat gtg aag gaa gtg gac cct gcc ggc cac tcc tac atc ctt gtc     2741
Ile Asp Val Lys Glu Val Asp Pro Ala Gly His Ser Tyr Ile Leu Val
            170                 175                 180

acc tgc ctg ggc ctc tcc tat gat ggc ctg ctg ggt gat gat cag agt     2789
Thr Cys Leu Gly Leu Ser Tyr Asp Gly Leu Leu Gly Asp Asp Gln Ser
        185                 190                 195

acg ccc aag acc ggc ctc ctg ata atc gtc ctg ggc atg atc tta atg     2837
Thr Pro Lys Thr Gly Leu Leu Ile Ile Val Leu Gly Met Ile Leu Met
    200                 205                 210

gag ggc agc cgc gcc ccg gag gag gca atc tgg gaa gca ttg agt gtg     2885
Glu Gly Ser Arg Ala Pro Glu Glu Ala Ile Trp Glu Ala Leu Ser Val
215                 220                 225                 230

atg ggg gct gta tga tgggagggag cacagtgtct attggaagct caggaagctg    2940
Met Gly Ala Val
                235
```

```
ctcacccaag agtgggtgca ggagaactac ctggagtacc gccaggcgcc cggcagtgat 3000
cctgtgcgct acgagttcct gtggggtcca agggcccttg ctgaaaccag ctatgtgaaa 3060
gtcctggagc atgtggtcag ggtcaatgca agagttcgca tttcctaccc atccctgcat 3120
gaagaggctt tgggagagga gaaaggagtt tgagcaggag ttgcagctag gccagtggg  3180
gcaggttgtg ggagggcctg gccagtgca  cgttccaggg ccacatccac cactttccct 3240
gctctgttac atgaggccca ttcttcactc tgtgtttgaa gagagcagtc acagttctca 3300
gtagtgggga gcatgttggg tgtgagggaa cacagtgtgg accatctctc agttcctgtt 3360
ctattgggcg atttggaggt ttatctttgt ttccttttgg aattgttcca atgttccttc 3420
taatggatgg tgtaatgaac ttcaacattc attttatgta tgacagtaga cagacttact 3480
gctttttata tagtttagga gtaagagtct tgcttttcat ttatactggg aaacccatgt 3540
tatttcttga attcagacac tacaagagca gaggattaag gtttttttag aaatgtgaaa 3600
caacatagca gtaaaataca tgagataaag acataaagaa attaaacaat agttaattct 3660
tgccttacct gtacctctta gtgtacccta tgtacctgaa tttgcttggc ttctttgaga 3720
atgaaattga attaaatatg aataaataag tcccctgct  cactggctca ttttttccca 3780
aaatattcat tgagcttccg ctatttggaa ggccctgggt tagtattgga gatgctaca  3839
```

```
<210> 6
<211> 1810
<212> DNA
<213> Homo sapiens

<220>
<221> CDS
<222> (452)..(1153)

<400> 6
gagctccagg aaccaggctg tgaggtcttg gtctgaggca gtatcttcaa tcacagagca  60
taagaggccc aggcagtagt agcagtcaag ctgaggtggt gtttcccctg tatgtatacc 120
agaggcccct ctggcatcag aacagcagga accccacagt tcctggccct accagccctt 180
ttgtcagtcc tggagccttg gcctttgcca ggaggctgca ccctgagatg ccctctcaat 240
```

```
ttctccttca ggttcgcaga gaacaggcca gccaggaggt caggaggccc cagagaagca  300
ctgaagaaga cctgtaagta gacctttgtt agggcatcca gggtgtagta cccagctgag  360
gcctctcaca cgcttcctct ctccccaggc ctgtgggtct caattgccca gctccggccc  420
```

```
acactctcct gctgccctga cctgagtcat c atg ctt ctt ggg cag aag agt        472
                                   Met Leu Leu Gly Gln Lys Ser
                                    1               5
```

```
cag cgc tac aag gct gag gaa ggc ctt cag gcc caa gga gag gca cca       520
Gln Arg Tyr Lys Ala Glu Glu Gly Leu Gln Ala Gln Gly Glu Ala Pro
         10              15                  20
```

```
ggg ctt atg gat gtg cag att ccc aca gct gag gag cag aag gct gca       568
Gly Leu Met Asp Val Gln Ile Pro Thr Ala Glu Glu Gln Lys Ala Ala
     25                  30                  35
```

```
tcc tcc tcc tct act ctg atc atg gga acc ctt gag gag gtg act gat       616
Ser Ser Ser Ser Thr Leu Ile Met Gly Thr Leu Glu Glu Val Thr Asp
 40                  45                  50                  55
```

```
tct ggg tca cca agt cct ccc cag agt cct gag ggt gcc tcc tct tcc       664
Ser Gly Ser Pro Ser Pro Pro Gln Ser Pro Glu Gly Ala Ser Ser Ser
                 60                  65                  70
```

```
ctg act gtc acc gac agc act ctg tgg agc caa tcc gat gag ggt tcc       712
Leu Thr Val Thr Asp Ser Thr Leu Trp Ser Gln Ser Asp Glu Gly Ser
             75                  80                  85
```

```
agc agc aat gaa gag gag ggg cca agc acc tcc ccg gac cca gct cac       760
Ser Ser Asn Glu Glu Glu Gly Pro Ser Thr Ser Pro Asp Pro Ala His
         90                  95                  100
```

```
ctg gag tcc ctg ttc cgg gaa gca ctt gat gag aaa gtg gct gag tta       808
Leu Glu Ser Leu Phe Arg Glu Ala Leu Asp Glu Lys Val Ala Glu Leu
     105                 110                 115
```

```
gtt cgt ttc ctg ctc cgc aaa tat caa att aag gag ccg gtc aca aag       856
Val Arg Phe Leu Leu Arg Lys Tyr Gln Ile Lys Glu Pro Val Thr Lys
120                 125                 130                 135
```

```
gca gaa atg ctt gag agt gtc atc aaa aat tac aag aac cac ttt cct       904
Ala Glu Met Leu Glu Ser Val Ile Lys Asn Tyr Lys Asn His Phe Pro
                 140                 145                 150
```

```
gat atc ttc agc aaa gcc tct gag tgc atg cag gtg atc ttt ggc att       952
Asp Ile Phe Ser Lys Ala Ser Glu Cys Met Gln Val Ile Phe Gly Ile
             155                 160                 165
```

```
gat gtg aag gaa gtg gac cct gcc ggc cac tcc tac atc ctt gtc acc      1000
Asp Val Lys Glu Val Asp Pro Ala Gly His Ser Tyr Ile Leu Val Thr
         170                 175                 180
```

```
tgc ctg ggc ctc tcc tat gat ggc ctg ctg ggt gat gat cag agt acg     1048
Cys Leu Gly Leu Ser Tyr Asp Gly Leu Leu Gly Asp Asp Gln Ser Thr
     185                 190                 195
```

```
ccc aag acc ggc ctc ctg ata atc gtc ctg ggc atg atc tta atg gag    1096
Pro Lys Thr Gly Leu Leu Ile Ile Val Leu Gly Met Ile Leu Met Glu
200             205             210             215

ggc agc cgc gcc ccg gag gag gca atc tgg gaa gca ttg agt gtg atg    1144
Gly Ser Arg Ala Pro Glu Glu Ala Ile Trp Glu Ala Leu Ser Val Met
            220             225             230

ggg gct gta tgatgggagg gagcacagtg tctattggaa gctcaggaag            1193
Gly Ala Val

ctgctcaccc aagagtgggt gcaggagaac tacctggagt accgccaggc gcccggcagt 1253
gatcctgtgc gctacgagtt cctgtggggt ccaagggccc ttgctgaaac cagctatgtg 1313
aaagtcctgg agcatgtggt cagggtcaat gcaagagttc gcatttccta cccatccctg 1373
catgaagagg ctttgggaga ggagaaagga gtttgagcag gagttgcagc tagggccagt 1433
ggggcaggtt gtgggagggc ctgggccagt gcacgttcca gggccacatc caccactttc 1493
cctgctctgt tacatgaggc ccattcttca ctctgtgttt gaagagagca gtcacagttc 1553
tcagtagtgg ggagcatgtt gggtgtgagg aacacagtg tggaccatct ctcagttcct  1613
gttctattgg gcgatttgga ggtttatctt tgtttccttt tggaattgtt ccaatgttcc 1673
ttctaatgga tggtgtaatg aacttcaaca ttcattttat gtatgacagt agacagactt 1733
actgcttttt atatagttta ggagtaagag tcttgctttt catttatact gggaaaccca 1793
tgttatttct tgaattc                                                 1810


<210> 7
<211> 920
<212> DNA
<213> Homo sapiens

<220>
<221> CDS
<222> (334)..(918)

<400> 7
acctgctcca ggacaaagtg daccccactg catcagctcc acctaccata ctgtcagtcc 60
tggagccttg gcctctgccg gctgcatcct gaggagccat ctctcacttc cttcttcagg 120
ttctcagggg acagggagag caagaggtca agagctgtgg dacaccacag agcagcactg 180
aaggagaaga cctgtaagtt ggcctttgtt agaacctcca gggtgtggtt ctcagctgtg 240
gccacttaca ccctccctct ctccccaggc ctgtgggtcc ccatcgccca agtcctgccc 300


acactcccac ctgctaccct gatcagagtc atc atg cct cga gct cca aag cgt   354
                                       Met Pro Arg Ala Pro Lys Arg
                                       1               5

cag cgc tgc atg cct gaa gaa gat ctt caa tcc caa agt gag aca cag   402
Gln Arg Cys Met Pro Glu Glu Asp Leu Gln Ser Gln Ser Glu Thr Gln
            10              15              20

ggc ctc gag ggt gca cag gct ccc ctg gct gtg gag gag gat gct tca   450
Gly Leu Glu Gly Ala Gln Ala Pro Leu Ala Val Glu Glu Asp Ala Ser
    25              30              35

tca tcc act tcc acc agc tcc tct ttt cca tcc tct ttt ccc tcc tcc   498
```

```
Ser Ser Thr Ser Thr Ser Ser Ser Phe Pro Ser Ser Phe Pro Ser Ser
 40                  45              50              Phe         55
```

```
tcc tct tcc tcc tcc tcc tcc tgc tat cct cta ata cca agc acc cca    546
Ser Ser Ser Ser Ser Ser Ser Cys Tyr Pro Leu Ile Pro Ser Thr Pro
                 60              65              70
```

```
gag gag gtt tct gct gat gat gag aca cca aat cct ccc cag agt gct    594
Glu Glu Val Ser Ala Asp Asp Glu Thr Pro Asn Pro Pro Gln Ser Ala
             75              80              85
```

```
cag ata gcc tgc tcc tcc ccc tcg gtc gtt gct tcc ctt cca tta gat    642
Gln Ile Ala Cys Ser Ser Pro Ser Val Val Ala Ser Leu Pro Leu Asp
         90              95              100
```

```
caa tct gat gag ggc tcc agc agc caa aag gag gag agt cca agc acc    690
Gln Ser Asp Glu Gly Ser Ser Ser Gln Lys Glu Glu Ser Pro Ser Thr
     105             110             115
```

```
cta cag gtc ctg cca gac agt gag tct tta ccc aga agt gag ata gat    738
Leu Gln Val Leu Pro Asp Ser Glu Ser Leu Pro Arg Ser Glu Ile Asp
120             125             130             135
```

```
gaa aag gtg act gat ttg gtg cag ttt ctg ctc ttc aag tat caa atg    786
Glu Lys Val Thr Asp Leu Val Gln Phe Leu Leu Phe Lys Tyr Gln Met
             140             145             150
```

```
aag gag ccg atc aca aag gca gaa ata ctg gag agt gtc ata aaa aat    834
Lys Glu Pro Ile Thr Lys Ala Glu Ile Leu Glu Ser Val Ile Lys Asn
             155             160             165
```

```
tat gaa gac cac ttc cct ttg ttg ttt agt gaa gcc tcc gag tgc atg    882
Tyr Glu Asp His Phe Pro Leu Leu Phe Ser Glu Ala Ser Glu Cys Met
         170             175             180
```

```
ctg ctg gtc ttt ggc att gat gta aag gaa gtg gat cc                 920
Leu Leu Val Phe Gly Ile Asp Val Lys Glu Val Asp
     185             190             195
```

```
<210> 8
<211> 9
<212> PRT
<213> Homo sapiens

<400> 8
Glu Ala Asp Pro Thr Gly His Ser Tyr
  1               5


<210> 9
<211> 9
<212> PRT
<213> Homo sapiens
```

<400> 9
Ser Ala Tyr Gly Glu Pro Arg Lys Leu
　1　　　　　　　5

<210> 10
<211> 9
<212> PRT
<213> Homo sapiens

<400> 10
Glu Val Asp Pro Ile Gly His Leu Tyr
　1　　　　　　　5

<210> 11
<211> 9
<212> PRT
<213> Homo sapiens

<400> 11
Phe Leu Trp Gly Pro Arg Ala Leu Val
　1　　　　　　　5

<210> 12
<211> 10
<212> PRT
<213> Homo sapiens

<400> 12
Met Glu Val Asp Pro Ile Gly His Leu Tyr
　1　　　　　　　5　　　　　　　　　　10

<210> 13
<211> 9
<212> PRT
<213> Homo sapiens

<400> 13
Ala Ala Arg Ala Val Phe Leu Ala Leu
　1　　　　　　　5

<210> 14
<211> 8
<212> PRT
<213> Homo sapiens

<400> 14
Tyr Arg Pro Arg Pro Arg Arg Tyr
　1　　　　　　　5

```
<210> 15
<211> 10
<212> PRT
<213> Homo sapiens

<400> 15
Ser Pro Ser Ser Asn Arg Ile Arg Asn Thr
  1               5                   10


<210> 16
<211> 9
<212> PRT
<213> Homo sapiens

<400> 16
Val Leu Pro Asp Val Phe Ile Arg Cys
  1               5


<210> 17
<211> 10
<212> PRT
<213> Homo sapiens

<400> 17
Val Leu Pro Asp Val Phe Ile Arg Cys Val
  1               5                   10


<210> 18
<211> 9
<212> PRT
<213> Homo sapiens

<400> 18
Glu Glu Lys Leu Ile Val Val Leu Phe
  1               5


<210> 19
<211> 9
<212> PRT
<213> Homo sapiens

<400> 19
Glu Glu Lys Leu Ser Val Val Leu Phe
  1               5


<210> 20
<211> 10
<212> PRT
<213> Homo sapiens
```

```
<400> 20
Ala Cys Asp Pro His Ser Gly His Phe Val
 1               5                   10


<210> 21
<211> 10
<212> PRT
<213> Homo sapiens

<400> 21
Ala Arg Asp Pro His Ser Gly His Phe Val
 1               5                   10


<210> 22
<211> 9
<212> PRT
<213> Homo sapiens

<400> 22
Ser Tyr Leu Asp Ser Gly Ile His Phe
 1               5


<210> 23
<211> 9
<212> PRT
<213> Homo sapiens

<400> 23
Ser Tyr Leu Asp Ser Gly Ile His Ser
 1               5


<210> 24
<211> 9
<212> PRT
<213> Homo sapiens

<400> 24
Met Leu Leu Ala Val Leu Tyr Cys Leu
 1               5


<210> 25
<211> 9
<212> PRT
<213> Homo sapiens

<400> 25
Tyr Met Asn Gly Thr Met Ser Gln Val
 1               5
```

<210> 26
<211> 9
<212> PRT
<213> Homo sapiens

<400> 26
Ala Phe Leu Pro Trp His Arg Leu Phe
  1   5

<210> 27
<211> 9
<212> PRT
<213> Homo sapiens

<400> 27
Ser Glu Ile Trp Arg Asp Ile Asp Phe
  1   5

<210> 28
<211> 9
<212> PRT
<213> Homo sapiens

<400> 28
Tyr Glu Ile Trp Arg Asp Ile Asp Phe
  1   5

<210> 29
<211> 15
<212> PRT
<213> Homo sapiens

<400> 29
Gln Asn Ile Leu Leu Ser Asn Ala Pro Leu Gly Pro Gln Phe Pro
  1   5   10   15

<210> 30
<211> 15
<212> PRT
<213> Homo sapiens

<400> 30
Asp Tyr Ser Tyr Leu Gln Asp Ser Asp Pro Asp Ser Phe Gln Asp
  1   5   10   15

<210> 31
<211> 9
<212> PRT
<213> Homo sapiens

```
<400> 31
Ala Ala Gly Ile Gly Ile Leu Thr Val
  1               5
```

```
<210> 32
<211> 10
<212> PRT
<213> Homo sapiens
```

```
<400> 32
Glu Ala Ala Gly Ile Gly Ile Leu Thr Val
  1               5                   10
```

```
<210> 33
<211> 9
<212> PRT
<213> Homo sapiens
```

```
<400> 33
Ile Leu Thr Val Ile Leu Gly Val Leu
  1               5
```

```
<210> 34
<211> 9
<212> PRT
<213> Homo sapiens
```

```
<400> 34
Lys Thr Trp Gly Gln Tyr Trp Gln Val
  1               5
```

```
<210> 35
<211> 9
<212> PRT
<213> Homo sapiens
```

```
<400> 35
Ile Thr Asp Gln Val Pro Phe Ser Val
  1               5
```

```
<210> 36
<211> 9
<212> PRT
<213> Homo sapiens
```

```
<400> 36
Tyr Leu Glu Pro Gly Pro Val Thr Ala
  1               5
```

<210> 37
<211> 10
<212> PRT
<213> Homo sapiens

<400> 37
Leu Leu Asp Gly Thr Ala Thr Leu Arg Leu
 1   5   10

<210> 38
<211> 10
<212> PRT
<213> Homo sapiens

<400> 38
Val Leu Tyr Arg Tyr Gly Ser Phe Ser Val
 1   5   10

<210> 39
<211> 9
<212> PRT
<213> Homo sapiens

<400> 39
Leu Tyr Val Asp Ser Leu Phe Phe Leu
 1   5

<210> 40
<211> 12
<212> PRT

<213> Homo sapiens

<400> 40
Lys Ile Ser Gly Gly Pro Arg Ile Ser Tyr Pro Leu
 1   5   10

<210> 41
<211> 9
<212> PRT
<213> Homo sapiens

<400> 41
Tyr Met Asp Gly Thr Met Ser Gln Val
 1   5

<210> 42
<211> 9
<212> PRT

<213> Homo sapiens

<400> 42
Gly Leu Tyr Asp Gly Met Glu His Leu
 1   5

<210> 43
<211> 9
<212> PRT
<213> Homo sapiens

<400> 43
Gly Leu Tyr Asp Gly Arg Glu His Ser
 1   5

<210> 44
<211> 10
<212> PRT
<213> Homo sapiens

<400> 44
Gly Leu Tyr Asp Gly Met Glu His Leu Ile
 1   5   10

<210> 45
<211> 10
<212> PRT
<213> Homo sapiens

<400> 45
Gly Leu Tyr Asp Gly Arg Glu His Ser Val
 1   5   10

<210> 46
<211> 9
<212> PRT
<213> Homo sapiens

<400> 46
Met Leu Leu Val Phe Gly Ile Asp Val
 1   5

<210> 47
<211> 10
<212> PRT
<213> Homo sapiens

<400> 47
Cys Met Leu Leu Val Phe Gly Ile Asp Val

```
   1                    5                    10
```

<210> 48
<211> 9
<212> PRT
<213> Homo sapiens

<400> 48
Phe Leu Leu Phe Lys Tyr Gln Met Lys
  1   5

<210> 49
<211> 9
<212> PRT
<213> Homo sapiens

<400> 49
Phe Ile Glu Gly Tyr Cys Thr Pro Glu
  1   5

<210> 50
<211> 9
<212> PRT
<213> Homo sapiens

<400> 50
Gly Leu Glu Leu Ala Gln Ala Pro Leu
  1   5

<210> 51
<211> 29
<212> DNA
<213> Homo sapiens

<400> 51
ggaattcatc atgcctcgag ctccaaagc   29

<210> 52
<211> 31
<212> DNA
<213> Homo sapiens

<400> 52
gctctagagc ttaggctatc tgagcactct g   31

<210> 53
<211> 31
<212> DNA
<213> Homo sapiens

<400> 53
gctctagagc ttagcactcg gaggcttcac t   31

<210> 54
<211> 31
<212> DNA
<213> Homo sapiens

<400> 54
gctctagagc ttaccaatct tgggtgagca g   31

<210> 55
<211> 21
<212> DNA
<213> Homo sapiens

<400> 55
cacagagcag cactgaagga g   21

<210> 56
<211> 23
<212> DNA
<213> Homo sapiens

<400> 56
ctgggtaaag actcactgtc tgg   23

<210>   57
<211>   9
<212>   PRT
<213>   Homo sapiens

<400>   57

Cys Leu Gly Leu Ser Tyr Asp Gly Leu
1   5